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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,556	10/20/2003	Dawson Richards Engler	STFD.043PA	8388

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EXAMINER
BERMAN, MELISSA J

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

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Office Action Summary	Application No.	Applicant(s)
	10/689,556	ENGLER, DAWSON RICHARDS
	Examiner	Art Unit
	Melissa J. Berman	2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _20 October 2003_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-25_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-25_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _20 October 2003_ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All   b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _8/30/2004_.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

This action is responsive to application 10/689556 filed on 10/23/2003. Claims 1-25 have

been examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-25 are rejected under 35 U.S.C. 102(a) as being anticipated by **Engler et al.**

(Bugs as Deviant Behavior: A General Approach to Inferring Errors in Systems Code, 2001)

hereafter referred to as **Engler**.

Claim 1, 9, 10, 18

Engler disclosed a method for identifying errors in program code, comprising:

performing by a processor the steps including, counting in the program code respective

numbers of observances (check message, see e.g., §3.3-§5.2, especially §3.4 and §5; EN:

instances record how often a rule was checked, stored as variable "n" and the number of

successful checks "n") of at least one correctness rule (rule, rule template, combination, see e.g.,

§1; §3-§4.1) by different code instances that relate to the at least one correctness rule (slot

instances, instances, see e.g., §1-§6, especially §3.3), wherein each code instance has an

associated counted number of observances of the correctness rule by the code instance ("c", see

e.g., §3.3-§5.2, especially §3.4 and §5; EN: instances record how often a rule was checked,

stored as variable "c");

counting in the program code respective numbers of violations (errors, see e.g., §3.3-

§5.2, especially §3.4 and §5; EN: instances record how often an error was encountered, stored as

variable "e") of the at least one correctness rule (rule, rule template, combination, see e.g., §1;

§3-§4.1) by different code instances (rule, rule template, combination, see e.g., §1; §3-§4.1) by

different code instances that relate to the at least one correctness rule (slot instances, instances,

see e.g., §1-§6, especially §3.3) that relate to the at least one correctness rule, wherein each code

instance has an associated counted number of violations of the correctness rule by the code

instance ("e", see e.g., §3.3-§5.2, especially §3.4 and §5; EN: instances record how often an error

was encountered, stored as variable "e");

determining for each code instance a respective likelihood of validity of the code instance

as a function of the counted number of observances and counted number of violations, wherein

the likelihood of validity indicates a relative likelihood that a related code instance is required to

observe the correctness rule (statistical analysis, z statistic, "z", see e.g., §1; §3-§3.4, especially

"more generally we use the "hypothesis test statistic" to rank errors based on the ratio of

successful checks to errors" §3.3; §5); and

outputting the violations in order of the likelihood of validity of a violated correctness

rule (ranking, see e.g., §1; §3-§3.4, especially "more generally we use the "hypothesis test

statistic" to rank errors based on the ratio of successful checks to errors" §3.3; §5).

Claim 2, 11, 19

Engler disclosed method of claim 1, wherein the determining step further comprises determining

a likelihood of the validity of each code instance as a function of an expected ratio of

observances to violations, the counted number of observances, and the counted number of

violations (ratio, see e.g., §1; §3-§3.4, especially "ratio of successful checks to errors" §3.3; §5).

Claim 3, 12, 20

Engler disclosed the method of claim 2, wherein the determining step further comprises

statistically ranking each violation according to a number of standard deviations away, a ratio of

the counted number of observances to the counted number of violations is from the expected

ratio (see e.g., §1; §3-§3.4; especially "measure the number of standard errors away the observed

ratio is from an expected ratio" §5).

Claim 4, 13, 21

Engler disclosed the method of claim 3, wherein statistically ranking each violation includes

determining a z statistic for proportions (see e.g., §1; §3-§3.4; especially z statistic §5).

Claim 5, 14, 22

Engler disclosed method of claim 1, further comprising:

wherein a first correctness rule specifies that a variable ("v", variable, see e.g., col

"Template (T)" Table 2; §1; § 3.3-§4.1) must be protected by a lock ("l", lock, see e.g., col

"Template (T)" Table 2; §1; § 3.3-§4.1) before accessing the variable ("l protects v", or lock

protects variable, or "l protects a", or lock protects a", see e.g., col "Template (T)" Table 2; §1; §

3.3-§4.1);

the step of counting an observance of the first correctness rule by a particular code

instance includes identifying program code that locks a particular first variable ("a", see e.g., col

"Template (T)" Table 2; §1; §3.3-§4.1) followed by program code that accesses a particular

second variable ("b", see e.g., Template 2; §1; § 3.3-§4.1); and

the step of counting a violation of the first correctness rule by the particular code instance

includes identifying program code that accesses the particular second variable where no

preceding program code locks the particular first variable (see e.g., especially code related by

implementation and code related abstractly, §4.2).

Claim 6, 15, 23

Engler disclosed the method of claim 1, further comprising:

wherein a first correctness rule specifies that invocation of a first function must not

follow an invocation of a second function in the program code (see e.g., §9-§9.3, especially "<b>

must follow <a>" or "no <a> after <b>", EN: Temporal rules);

the step of counting an observance of the first correctness rule by a particular code

instance includes identifying program code that includes a sequence of instructions that includes

invocation of a particular second instruction and no previous invocation of a particular first

function (see e.g., §9-§9.3, especially "<b> must follow <a>", EN: Temporal rules); and

the step of counting a violation of the first correctness rule by the particular code instance

includes identifying program code that includes a sequence of instructions in which an

invocation of a particular first function is present following invocation of a particular second

instruction (see e.g., §9-§9.3, especially "no <a> after <b>", EN: Temporal rules).

Claim 7, 16, 24

Engler disclosed the method of claim 1, further comprising:

wherein a first correctness rule specifies that invocation of a first function must follow an

invocation of a second function in the program code (see e.g., §9-§9.3, especially "<b> must

follow <a>" or "no <a> after <b>", EN: Temporal rules);

the step of counting an observance of the first correctness rule by a particular code

instance includes identifying program code that includes a sequence of instructions that includes

an invocation of a particular first function following invocation of a particular second instruction

(see e.g., §9-§9.3, especially "<b> must follow <a>", EN: Temporal rules); and

the step of counting a violation of the first correctness rule by the particular code instance

includes identifying program code that includes a sequence of instructions that includes an

invocation of the particular second instruction without a previous invocation of the particular

first function (see e.g., §9-§9.3, especially "no <a> after <b>", EN: Temporal rules).

Claim 8, 17, 25

Engler disclosed the method of claim 1, further comprising:

wherein a first correctness rule specifies that data returned from a first function must be

tested for a status indication (check, see e.g., §3.1-§3.2; §4; §6-§7.3; EN: status check for status

NULL);

the step of counting an observance of the first correctness rule by a particular code

instance includes identifying program code that includes a sequence of instructions that includes

an invocation of a particular first function and a subsequent test of data returned from the

particular first function (see e.g., §3.1-§3.2; §4; §6-§7.3; EN: subsequent tests use belief sets,

which test where the current status and what is true in the belief set contradict); and

the step of counting a violation of the first correctness rule by the particular code instance

includes identifying program code that includes a sequence of instructions that includes an

invocation of a particular first function without a subsequent test of data returned from the

particular first function ("flagging", see e.g., §3.1-§3.2; §4; §6-§7.3; EN: belief contradicts the

pointer, is therefore already set as a an error, without summoning subsequent tests).

Conclusion

The prior art of record and not relied upon is considered pertinent to the applicant's

disclosure.

- Haley et al. (Patent No. 6154876)

- Leino et al. (Pub No. 2002/0046393)

- Engler et al. (Checking System Rules Using System-Specific, Programmer-Written

   Complier Extensions, 2000)

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Melissa Berman whose telephone number is 571-270-1393. The
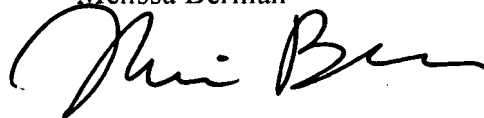
examiner can normally be reached on 9/4/5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Melissa Berman

MB

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